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FREESIA, KLATT, AND ITS HISTORY.

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This charming genus of *Iridaceae* has long been familiar to horticulturists and valued by them for the beauty and fragrance of its flowers, and many beautiful hybrid forms have been produced in our gardens. Yet, apart from a few notes and descriptions of new species, no history of the genus nor proper descriptive account of its species has hitherto been published.

Personally the writer has previously had contact with this genus on three occasions only, and each time recognised that to properly deal with any new form the whole genus first required a thorough examination and revision (as is the case with most genera of *Iridaceae*), for which time could not then be spared and so mistakes were made. For *Freesia* has proved a stumbling block to every botanist that has had anything to do with it, from Klatt, who founded the genus, to and including living authors of the present time. And it is a curious fact that, while horticulturists in the main have clearly recognised as distinct and have correctly named the plants they cultivated, botanists (myself included) have not escaped the making of gross misidentifications, because the characteristics of the species have not been heeded. It was not until I began to study the genus in July, 1933, that I became fully aware of the confusion in which the species were becoming enmeshed, and which caused me to make an investigation of all available material and collect such published information as I could find, the following account being the result.

As recognised to-day the genus *Freesia* was established by Klatt in 1866 in *Linnaea*, v. xxxiv, p. 672, as "*Freesia*, Ecklon," because Ecklon had distributed a species under the unpublished name of "*Freesia odorata*, Ecklon," which Klatt there described under that name. But Ecklon has nowhere published characters of a genus to which that plant could be referred. Ecklon, however, did publish in 1827, in his *Topographisches Verzeichniss*, p. 30, a genus named "*Freesea*, Eckl." but did not characterise it, except by a very imperfect description of a plant he named "*F. miniato-lateritia*, Eckl.," which is the well-known *Tritonia*

miniata, Ker. With this Ecklon associates three other species of *Tritonia* and an *Ixia*. Therefore *Freesea* of Ecklon as a genus vanishes, for it never had the slightest claim to be recognised, and the generic name *Freesia* with its modified spelling is correctly attributed to Klatt. It is stated in some books that the derivation of the name is unknown, but Prof. L. Diels, Director of Berlin Herbarium, informs me that Ecklon named the genus *Freesea* after his college companion and friend, Dr. Friedrich Heinrich Theodor Freese, who was a physician at Kiel, where he died on Aug. 26th, 1876. This corroborates the similar statement made by Marloth in his *Flora of S. Africa*, v. iv, p. 150.

From the above the modified spelling *Freesia* adopted by Klatt must evidently be considered to have the same derivation.

Klatt recognised four species and one variety, viz., *F. odorata*, *F. Leichlinii*, *F. xanthospila* and *F. refracta* and its variety *alba*; and Prof. Michael Foster recognised the same, but gave the name *F. alba* to the plant Klatt described as *F. refracta alba*, overlooking the fact that the specific name *F. lactea*, Fenzl, had already been quoted for it as a synonym by Klatt. Baker in *Flora Capensis*, v. vi, and elsewhere considered these five to be mere varieties of one species, besides including with them some other distinct species which were not then named. And Marloth in his *Flora of S. Africa*, v. iv, p. 150, also adopts the view that there is only one variable species belonging to the genus. Some of the species certainly do bear a superficial resemblance to one another; especially is this the case with dried specimens, causing botanists to make misidentifications. This happened because the real characters that distinguish the species were overlooked and unrecorded until 1888, when Prof. Michael Foster made use of some of them, but the distinctions were either overlooked or not made use of by Baker or others until 1927, when Mrs. L. Bolus began to make use of them. Therefore we find that in various herbaria Klatt has named and autographed the name in each case no less than four perfectly distinct species as being "*F. refracta*"! And from quotations given under *F. lactea* and *F. xanthospila*, var. *Leichlinii* it will be noted that Prof. MacOwan failed to distinguish various species from one another when alive! So that it is not to be wondered at that both botanists and horticulturists have been baffled and confusion has resulted, which it is hoped the following account may tend to elucidate. For I have had the privilege of being able to examine and simultaneously compare the type specimens of Burmann in the Geneva herbarium, of Klatt in Berlin and Vienna herbaria, and the material in the Kew, British Museum, Cambridge, Zurich, Cape Town, Albany and Pretoria herbaria, for which I thank and greatly appreciate the courtesy accorded to me by the respective Directors of those institutions.

Of the species now placed in the genus *Freesia* the first that were discovered appear to be *F. corymbosa* and *F. caryophyllacea*, both of which occur in Burmann's herbarium, now at Geneva, and according to a note with the specimen, *F. caryophyllacea* was described from bulbs introduced from the Cape into Europe, where they flowered in 1759 and the description was published in 1768 under the name of *Ixia caryophyllacea*.

F. corymbosa is a change of name for the plant described by Klatt as *F. odorata* and widely named in herbaria as being *F. refracta*, which does not appear to have been introduced into Europe until about 1831, while Burmann's specimen is probably of Cape origin and dates from before 1768, when Burmann described it under the name of *Gladiolus corymbosus*, indicating that he did not consider it to belong to the same genus as *F. caryophyllacea*.

Eight years later, in 1786, *F. refracta* was published by Jacquin under the name of *Gladiolus refractus*, but its discoverer and locality are not mentioned.

No further addition to the genus was made until 1807, when *F. xanthospila* was published as being a *Gladiolus*. And in 1812 Burchell collected *F. Andersoniae* in Bechuanaland, but it has only recently been named.

In 1814 *F. Sparrmannii* was added, being described as a *Gladiolus* by Thunberg, who received it from Sparrmann.

Probably many will be surprised to learn that the beautiful pink-flowered *F. Armstrongi*, which is considered to be a somewhat modern discovery, was really discovered over 100 years ago by the Kew collector Bowie, who sent bulbs to Kew Gardens, where it flowered, and an excellent coloured drawing of it was made by Bond, a Kew artist, on May 19 1826!

From that time onward it is probable that occasional specimens of the genus appeared in European gardens, but it was not until after the publication of *F. Leichtlinii* in 1874 that the genus began to attract the fancy of horticulturists, and the cultivation of Freesias became more general. For, on account of their free flowering habit, decorative character and the fragrance of their flowers, they speedily attracted attention, and the inevitable production of hybrids resulted, especially during the first two decades of this century, during which a large number of hybrid variations have been created, references to some of which will be given later.

But, as this account of the species will demonstrate, the possible production of new types of hybrids is by no means limited to the few species at present cultivated in Europe, as there are several others of which horticulturists in Europe appear to have no knowledge, and

probably there are others still awaiting discovery, as the genus appears to be spread over a large part of S. Africa, extending from the south coast far into the interior and reaching Bechuanaland, where *F. Andersoniae* occurs, and ranges from there through all the divisions along the Orange River eastward to the Orange Free State and southward to Carnarvon and Graaff Reinet divisions, this species having the widest range of all at present known. *F. corymbosa* ranges from Humansdorp through Uitenhage, Bathurst and Albany divisions. Most of the other species appear to be concentrated in the south coastal area extending from Caledon to Humansdorp division, and within that region the species appear to be somewhat local or to inhabit a comparatively small area. Also there are species that extend the range of the genus westward, which occur in Malmesbury, Worcester, Van Rhynsdorp and Ceres divisions.

During the early period of the adoption of this genus by horticulturists various accounts of its cultivation appeared in gardening papers, of which those given in the *Gardeners Chronicle*, 1888, v. iii, pp. 52, 83, 107, 119, 152, 182, 235 and 649 appear to be about the best and are all in one volume, and will suffice to give instruction, as all the information required will be found in them. And in *Journ. Soc. Hort. France*, 1891, pp. 152 and 215, P. Duchartre gives a full account of the mode of growth of this genus, well illustrated by figures on pp. 159, 222 and 226. As the method of cultivation and mode of growth of this genus is now well known to horticulturists it is unnecessary to repeat them here.

In S. Africa Freesias appear to have but one flowering period, but a writer in the *Gard. Chron.*, 1889, v. iv, p. 407, states that under cultivation, in suitable localities, "they may be had in bloom from bulbs nearly the whole year round."

As previously mentioned, the characters that distinguish the species from one another appear first to have been made use of by Prof. Michael Foster in *Gard. Chron.*, 1888, v. iii, p. 588, and on p. 589 he calls attention to the fact that different species differ in their odour.

The distinctive characters these plants possess and which I have used in the following key and descriptions are :—

1. The outer bracts of the flowers (always termed bracts in the key and descriptions, as the inner bracts are of no specific importance except in *F. Andersoniae*, where they are longer than the outer bracts), are green in some species, with or without narrow membranous edges, and in others they are membranous, at least in the upper half. This character of green or membranous bracts is constant for each species and serves to divide the genus into two groups. In the case of dried specimens, however, unless one has acquired a little experience it is sometimes a

little difficult to be sure if the bracts were green or membranous when alive. Yet on the living plant the difference is very obvious.

2. The three inner lobes of the flower in some species are more or less cordate or ear-lobed at the base, and the ear-lobed margins are incurved. In other species the inner three lobes are either rounded into or slightly and gradually narrowed at the base. This character of the form of the inner lobes of the flower is also constant for each species, is easily seen and, again, serves to divide the species into two groups.

3. The size of the flower varies to some extent in the same species, but on the whole is a fairly constant character. The form of the flower is constant, and the relative length of the slender part of the tube is also fairly constant for each species.

4. The leaves of most species are ascending; in some, however, they are bent down towards the ground, and this character is constant for each species. The length, breadth and obtuseness of the leaves, which in some species appear to be constant and reliable characters are inconstant in others, and under cultivation sometimes become changed. Even in S. Africa, where under natural conditions and fully exposed to the sun the leaves of a species are only 4-6 inches long, become 1-1½ foot long under cultivation or when growing among other vegetation.

In this account the term leaves implies the blades of the leaves only and does not include their sheaths; and in common with those of many other *Iridaceae* they are often gradually or somewhat abruptly broadened above their base by an increase in width along the upper edge, and the midrib at that part is often more or less curved. This also is a specific character that appears to be fairly constant.

5. The stem is constantly simple in some species and usually branched in others, but this cannot be used as a constant character because a weak plant of a normally branched species may have a simple stem.

Certain species have the stem or lower part of it sprinkled with microscopic points, which are scarcely evident to the naked eye, but are somewhat rough to the touch. Such stems have been described by a South African botanist as pubescent. And morphologically these points are hairs, but I do not think the gardener or even most botanists would recognise them as constituting pubescence as generally understood. I have, therefore, used the term microscopic points for them as being more definite, except in the case of *F. caryophyllacea*, where they are more hair-like and crowded and more like a pubescence in character. The presence or absence of these microscopic points can scarcely be used as a specific character, at least not in all cases, because different specimens

of the same species and gathered at the same time and place have some stems glabrous and others with microscopic points upon them, and I have seen specimens with two stems to a corm in which one stem is glabrous and the other has microscopic points upon it! None of the older authors mention any pubescence or microscopic points; probably they were overlooked, for they are very inconspicuous, but certainly occur on specimens seen by Klatt, Foster and Baker.

6. The colour of the stamens and stigmas may perhaps afford characters for living plants, but cannot be made use of for dried specimens. And the relative length of these organs may or may not be of sexual significance, but seems to have no specific value except in the case of *F. flava*, where the style is protruded far beyond the stamens.

FREESIA, Klatt.

Rootstock, a corm with fibrous tunics. Leaves two-ranked, laterally flattened. Stem simple or branched. Spike usually bent at an abrupt angle from the stem or its branches, but occasionally continuous with it, and with the flowers all on the upper side of the spike. Bracts two to each flower, small. Flower resupinated (inverted), 6-lobed, with a distinct and usually curved tube, funnel-shaped at the upper part and abruptly or gradually narrowed downwards into a slender part; lobes either all similar and slightly and gradually narrowed to the base, or the three inner dissimilar from the outer and either rounded in or cordate or earlobed at the base. Stamens 3; anthers linear, never reaching to the tips of the upper lobes of the flower. Style equalling or longer than the stamens. Stigmas 6, the style-branches being deeply bifid, usually not attaining to the tip of the upper lobe, but in one species exceeding it and occasionally by the spread of the lobes appearing much exserted. Capsule subglobose, 3-celled, with loculicidal dehiscence. Seeds not seen, described as subglobose, apparently few in each cell.—Klatt in *Linnaea*, v. xxxiv., p. 672 (1866).

Species 19 or more, all natives of South Africa.

For origin of generic name see p. 2.

This genus is easily recognised by its six stigmas and the manner in which the flower-spikes are usually bent at an angle from the stem, with the flowers arranged in a row along the upper side. Also in this genus the flowers are inverted or upside down; the lobes that in the descriptions are termed lower lobes being uppermost in position on the spike, as they are turned towards the apex of the spike, and just the reverse of the flowers of a *Gladiolus*.

KEY TO THE SPECIES.

[N.B.—The term “bracts” always means the outer bract of each flower, which, except in *F. Andersoniae*, is longer than the inner bract.]

1. Flower with the slender part of the tube $1\frac{1}{2}$ line in diameter in dried specimens and only $2-2\frac{1}{2}$ lines long; lobes obovate, very broadly rounded at the apex; bracts green; leaves shortly acute 9. *Herberti*.
 Flower with the slender part of the tube $\frac{1}{2}-\frac{3}{4}$ line in diameter in dried specimens and as figured when alive and 2-16 lines long; lobes all oblong or the inner three ovate or more or less cordate, all obtuse but not very broadly rounded at the apex (to end of key) 2.
2. Leaves very obtuse or rounded at the apex 3.
 Leaves or at least the upper subacute, or shortly and acutely pointed or tapering to an acute point (to end of key) 6.
3. Bracts membranous, at least at the upper part, and the three inner lobes of the flower cordate or earlobed at the base 4.
 Bracts green, and all the lobes of the flower slightly and gradually narrowed at the base; leaves (often by an abrupt bend at the base of the stem) all bent towards the ground 5.
4. Flower 26-28 lines long, its upper lobes light yellow and the lower lobes rich yellow with orange blotches 3. *speciosa*.
 Flower 16-17 lines long, its upper lobes pale mauve, and the lower lobes cream-colour marked with orange and with 1-3 brownish lines extending down the orange tube 4. *occidentalis*.
5. Plant (including flowers) $1\frac{1}{2}$ -3 inches high above the ground; leaves $\frac{1}{2}$ - $1\frac{1}{2}$ inch long, oval to oblong; flower apparently white with yellow markings on the lower lobes 1. *parva*.
 Plant 5-10 inches high; leaves $1\frac{1}{2}$ -4 inches long; flower yellow with orange or golden blotches on the lower lobes 2. *Fergusoniae*.
6. Leaves more or less acute; bracts or their upper part membranous, often with dark brown tips 7.
 Leaves more or less acute; bracts green, with or without narrow membranous edges; inner lobes of flower not cordate nor ear-lobed at the base, but either slightly and gradually narrowed there or (in *F. Middlemostii*) rounded into the base; style and stigmas shorter than the lobes, but sometimes falsely appearing longer when the lobes spread widely 11.
7. Style exserted far beyond the anthers and as long as or longer than the entire flower, being the only species in which it is so; flower $2-2\frac{1}{2}$ inches long, yellow with an orange blotch on the lower middle lobe 18. *flava*.

- Stylo and its stigmas shorter than the lobes of the flower 8.
8. Flowers $1\frac{3}{4}$ - $2\frac{3}{4}$ inches long, much eurved, whitish or pale yellowish, with the three inner lobes rounded into (but not distinctly cordate or ear-lobed at) the base, sometimes on one side only 19. *Andersoniae*.
- Flowers $1-1\frac{1}{2}$ inch long, with the three inner lobes more or less cordate or ear-lobed at the base 9.
9. Flower with all its lobes rosy pink 8. *Armstrongii*.
- Flower with its upper lobes yellow or dingy greenish yellow and the lower lobes blotched with orange or fulvous 10.
10. Bracts with dark brown tips; flower pale to intense yellow, with orange-yellow blotches on the lower lobes 10. *corymbosa*.
- Bracts not brown at the tips, but sometimes purplish tinted; flower dingy greenish yellow, with fulvous or brownish-yellow blotches on the three lower lobes 11. *refracta*.
11. Bracts green; leaves (or those of sun-exposed plants) all bent down towards the ground; flowers white, blotched with orange-yellow on the lower lobes. (See also *C. earyophyllacea*, whose leaf-pose is unknown.) 12.
- Bracts green; leaves erect or ascending; lobes of the flower all gradually and slightly narrowed at the base, none ear-lobed (to end of key) 13.
12. Inner lobes of flower rounded into the base 5. *Middlemostii*.
- Inner lobes of flower gradually and slightly narrowed at the base 6. *climensis*.
13. Lobes and the slender part of the tube of the flower each about 5 lines long, the entire flower being $1-1\frac{1}{4}$ inch long; upper lobes white, apparently purplish on the back, and the lower lobes yellow; bracts $2-2\frac{1}{2}$ lines long. Lobes of the flowers 6-10 lines long, the entire flower being $1\frac{1}{2}-2\frac{1}{2}$ inches long; bracts mostly 3-6 lines long 14.
14. Flower white, with some v-shaped mauve markings in the tube and the middle lobe of the lower three marked with two yellow spots near the base 6. *climensis*.
- Flower without v-shaped markings in the tube 15.
15. Flowers entirely white without yellow or other markings on the lobes; bracts 4-6 lines long; slender part of the tube 6-8 lines long 17. *laetia*.
- Flowers with yellow blotches on the lower lobes and sometimes flushed with purplish on the back of the upper lobes 16.
16. Bracts 4-6 lines long; slender part of the flower-tube 5-8 lines long 17.
- Bracts 2-4 lines long; slender part of the flower-tube $2\frac{1}{2}-5$ lines long 18.
17. Leaves $3-5\frac{1}{2}$ lines broad, shortly acute; flowers $2-2\frac{1}{2}$ inches long, apparently white or pale yellow, with the lower middle lobe orange-yellow 14. *gentilis*.

Leaves $2\frac{1}{2}$ - $3\frac{1}{2}$ lines broad, tapering to an acute apex; flowers $1\frac{1}{2}$ -2 inches long, apparently with the upper three lobes white or pale sulphur-yellow, flushed with purplish on the back and the lower three yellow ..

15. *picta*.
18. Naked part of the stem between the spike and the uppermost reduced leaf about 1 inch long and densely covered up to the spike with microscopic outstanding points or hairs; leaf 4 inches long and 6 lines broad, gradually tapering from the middle to an acute apex .. 7. *caryophyllacea*.
- Naked part of the stem between the spike and the uppermost reduced leaf 2-6 inches or more long, glabrous or sprinkled with microscopic points on the lower part; leaves 3-24 inches long; flowers $1\frac{1}{2}$ -2 inches long 19.
19. Flower with the slender part of the tube $2\frac{1}{2}$ -3 (rarely 4) lines long and the lobes 6-7 lines long, white or pale yellow with orange-yellow blotches on the lower lobes; when fading or drying the upper lobes often change to a pale violaceous colour 12. *Muirii*.
- Flower with the slender part of the tube 4-5 lines long and the lobes 7-8 lines long 20.
20. Flower white with a yellow blotch on the middle one or on all three of the lower lobes 16. *xanthospila*.
- Flower yellow with orange blotches on the lower lobes 16. *xanthospila* var. *Leichtlinii*.

I. F. PARVA, N. E. Br. Entire plant $1\frac{1}{2}$ -3 inches high. Leaves apparently spreading over the ground or bending towards it, perhaps all on one side, $\frac{1}{2}$ - $1\frac{1}{2}$ inches long, $2\frac{1}{2}$ -6 lines broad, broadened by an abrupt rise of the upper edge, oval to oblong, very obtuse or rounded at the apex, usually apiculate. Stem often bent close to the ground so that the spike is horizontal and including the latter but not the flowers is $\frac{3}{4}$ - $2\frac{1}{2}$ inches long, simple or branched and bearing 2-5 flowers, glabrous or sprinkled with microscopic points. Bracts 3-5 lines long, green. Flowers $1\frac{1}{4}$ - $1\frac{1}{2}$ inches long, apparently white or creamy inside, sometimes flushed with violaceous or purplish outside, with the middle one of the lower lobes orange shading into yellow at the margins, and the marginal parts of the lateral lobes also yellow; tube 8-10 lines long, abruptly contracted into the slender part, which is 2-3 lines long and not or scarcely exerted from the bracts; lobes 6-9 lines long, the outer $2\frac{1}{2}$ - $3\frac{1}{2}$ lines broad, the inner $3\frac{1}{2}$ - $4\frac{1}{2}$ lines broad, all oblong, obtuse, slightly and gradually narrowed at the base.

Bredasdorp Div.: near Elim, *Schlechter* 7727!

This is the smallest of all the known species and recognisable at once by its short and broad leaves.

2. F. FERGUSONIAE, L. Bolus in *S. Afr. Gard.*, 1927, pp. 336-337, f. 3-5, and in *Nature Notes*, 1927, no. 50, p. 6, f. 3-5. Plant 5-10 inches

high. Leaves all bent towards the ground, $1\frac{1}{2}$ -4 inches long, 4-9 lines broad, oblong to cuneately oblong gradually or abruptly broadening upwards, usually very obtuse. Stem much overtopping the leaves, simple, sprinkled with microscopic points on the lower part. Bracts 2-3 lines long, green. Flowers $1\frac{1}{3}$ - $1\frac{2}{3}$ inches long, yellow, sometimes changing to dingy fuscous when dried, with the sides of the three lower lobes dull orange, sometimes changing to dull orange-brown when dried, scented, but not fragrant; tube 10-12 lines long, abruptly narrowed into the slender part, which is 3-4 lines long; upper three lobes about 8 lines long and $3\frac{1}{2}$ -4 lines broad, with the dorsal or inner one somewhat elliptically obovate, cuneately narrowed to the base and sometimes (always?) slightly hooded at the apex, and the lateral lobes oblong and gradually narrowed at the base; lower three lobes $6\frac{1}{2}$ -7 lines long and 2-3 lines broad, cuneately obovate; all the lobes obtuse.

Riversdale Div.: near Riversdale, *Muir* 4352! 4429! 4430! *Ferguson*.

3. *F. SPECIOSA*, L. Bolus in *S. Afr. Gard.* 1929, p. 385. Plant about 10 inches high. Leaves 3-4 inches long and up to 11 lines broad, with the lower half cuneate and the upper half oblong and very obtuse at the apiculate apex of the only leaf seen. Stem branching. Bracts 4-5 lines long, membranous at the upper part, obtuse or truncate. Flowers 26-28 lines long, with the upper lobes and upper part of the tube light yellow and the lower part of the tube and lower lobes rich yellow with orange blotches on the latter, which each have a purple mid-line; tube 19-20 lines long, abruptly contracted into the slender part, which is 6-7 lines long; lobes 7-8 lines long, the three outer $4-4\frac{1}{2}$ lines broad, oblong-ovate; the three inner 5-7 lines broad and more or less cordate or ear-lobed at the base; all obtuse.

Swellendam Division: between Bonnievale and Barrydale, *Archer*!

4. *F. OCCIDENTALIS*, L. Bolus in *S. Afr. Gard.* 1933, p. 255, f. B, and p. 266. Plant 5-7 inches high. Leaves ascending, $2-4\frac{1}{4}$ inches long, $2\frac{1}{2}$ -6 lines broad, sometimes cuneate in general outline, but more often by an abrupt rise of the upper edge below or near the middle the upper part of the leaf is more or less oblong, obtuse or rounded or sometimes slightly hooded at the apex, glaucous-green. Stem about as long as the leaves, simple, glabrous. Bracts $2\frac{1}{2}$ - $3\frac{1}{2}$ lines long, obtuse, green below, membranous and often purplish above. Flower 12-17 lines long, fragrant; tube 9-11 lines long, abruptly contracted into the slender part, which is about $2\frac{1}{2}$ -3 lines long; lobes unequal; the outer about $4\frac{1}{2}$ lines long and $2\frac{1}{2}$ -3 lines broad, ovate, obtuse; the inner about 4-5 lines long and $4\frac{1}{2}$ -5 lines broad, broadly cordate or ear-lobed at the base; the three upper lobes are pale mauve and the three lower cream-coloured, blotched

with rich orange-yellow, and with 1-3 brownish lines on the two inner lobes extending down the orange-yellow tube.

Van Rhynsdorp Div.: near Nieuwefontein, *Compton* 4273!

Described partly from specimens of the type gathering.

5. *F. MIDDLEMOSTII*, Barker in *S. Afr. Gard.* 1933, p. 112, with fig. Plant 6-8 inches high. Leaves 7-8 to a corm, more or less bent down towards the ground on one side of the plant, 1-5 inches long, $2\frac{1}{2}$ - $4\frac{1}{2}$ lines broad, linear, acute or somewhat tapering to an acute point, broadening on the upper edge below the middle or towards the base by a small and not very abrupt rise, and the midrib nearly straight at that part. Stem branched, not exceeding the leaves, covered with microscopic points, or very minute stiff, outstanding hairs. Bracts $3\text{--}4\frac{1}{2}$ lines long, obtuse, often apiculate, green, with a very narrow, white, membranous edge at the apex. Flowers about $1\frac{1}{2}$ inches long; tube about 1 inch long, with the upper part abruptly contracted into the slender part which is 3-4 lines long; lobes 6-7 lines long and $4\frac{1}{2}$ -5 lines broad, all elliptic-ovate, obtuse, rounded into the base from below the middle and the inner three more so than the outer, but not cordate nor carlobed, white within, with orange-yellow blotches on the three lower lobes and at the insertion of the stamens, and suffused with purplish (always?) on the back of the upper lobes.

Bredasdorp Div.: near Bredasdorp, *Middlemost!*

Described from part of the type gathering. This and *F. climensis*, L. Bol., are closely allied and may prove to be only varieties of one another.

6. *F. ELIMENSIS*, L. Bolus in *S. Afr. Gard.*, 1933, pp. 167-168, f. A. Plant 3-12 inches high, very variable in appearance according to whether fully exposed to the sun or growing in shade. Leaves on plants exposed to sun $1\frac{1}{4}$ -3 inches long, $2\frac{1}{2}$ - $4\frac{1}{2}$ lines broad, varying from oblong to linear-lanceolate, acute or tapering to an acute point rarely (on young plants only) obtuse, sometimes ascending, sometimes bent down towards the ground; on plants growing in shade suberect, $3\text{--}6\frac{1}{2}$ inches long, $1\frac{1}{2}$ - $4\frac{1}{2}$ lines broad, linear, acute; in all the midrib is nearly straight at the basal part, and the increased breadth of the upper edge makes but a small although abrupt rise; deep green. Stem simple or branched and on sun-exposed plants more or less bent to one side from near the base, about equalling the leaves in length, sprinkled with minute points or occasionally glabrous. Spike 2-6-flowered, sometimes bent at an angle from the stem, at others continuous with it. Bracts $3\frac{1}{2}$ -5 lines long, obtuse or 3-toothed or rarely acute, green, with very narrow white edges. Flowers 18-22 lines long; tube 10-14 lines long, with the funnel-shaped part abruptly contracted into the slender part, which is 3-6 lines long; lobes 6-9 lines long, $4\text{--}4\frac{1}{2}$ lines broad, all alike in form and subequal, very

slightly spreading, oblong, subacute or obtuse, scarcely or but slightly narrowed at the base, white, with a faint pinkish tinge on the outside, usually changing to pale lilac in the process of drying, with the middle lobe of the lower three marked with two yellow spots or a yellow blotch near its base, or sometimes two of the lobes are marked with a yellow blotch; the two lateral of the lower lobes are each marked on the basal part with 5-7 mauve-coloured lines, the funnel part of the tube bears three V-shaped mauve markings inside, and the part of the tube below the insertion of the stamens is yellow within. Style, stigmas and filaments white; anthers mauve.

Bredasdorp Div., between Bredasdorp and Elim, *Barker!*

Described partly from living plants sent to Kew by Mrs. L. Bolus, which flowered in November, 1933, and partly from dried material, both from the type gathering.

7. *F. CARYOPHYLLACEA*, N. E. Br. in *Kew Bull.*, 1929, p. 134. The type specimen consists of one detached developed leaf, one small imperfectly-formed leaf, which may have been an outermost basal one, and a flower-stem. The developed leaf is 4 inches long and 6 lines broad, obliquely lanceolate, tapering to an acute point, with the midrib curved below the middle, where the upper edge of the leaf somewhat abruptly increases in width; the imperfectly-formed leaf is $2\frac{1}{2}$ inches long and $2\frac{1}{2}$ lines broad at the dilated, linear-spathulate, obtuse apex. Stem apparently exceeding the leaves; pubescent with distinct but very minute hairs, not microscopic points, and bearing one narrow broken stem-leaf, just above which it is abruptly bent sideways and then at a short distance beyond is abruptly curved upwards, ending in a spike $1\frac{1}{2}$ inches long, with evidence of five flowers about 2 lines apart, of which four remain. Bracts $3-3\frac{1}{2}$ lines long, obtuse or subtruncate at the apex, green. Flowers $1\frac{3}{4}$ inches long, apparently white with a yellow blotch on the lower middle lobe of one flower, while another apparently has the two lateral of the three lower lobes blotched with yellow and the middle lobe white, and all three in all the flowers have a darker midline, but which does not show evidence of having been coloured; the throat of the tube is yellow, and a faint duskiess about the tips of the lobes of this 174 years old specimen may indicate that when alive they were purplish or lilac-tinted on the back; tube 9-11 lines long, apparently not curved, funnel-shaped above and abruptly narrowed into the slender part, which is $3\frac{1}{2}$ -4 lines long; lobes 8-10 lines long, $3-3\frac{1}{2}$ lines broad, subequal, narrowly oblong, all with subparallel sides but slightly narrowed at the base, obtuse.—*Ixia caryophyllacea*, Burmann, *Fl. Cap. Prodr.*, p. 1* (1768), and N. E. Br. in *Kew Bull.*, 1929, p. 134. *Antholyza caryophyllacea*, Roem. and Schultes, *Syst. Veg.*, v. i., p. 448. *Anisanthus caryophyllaceus*, Klatt, *Erganz.* p. 10.

South Africa : locality unknown. Known only from a cultivated specimen in Burmann's Herbarium ! introduced from the Cape, which flowered according to the label in 1759, but according to Burmann's description in 1754.

The above description is made entirely from Burmann's type specimen. The pubescence on the stem extends up to the flower-spike, and although minute and scarcely evident without a lens, is a rather dense pubescence of spreading hairs and quite distinct in character from the microscopic points sprinkled (usually) on the lower part of the stems of some other species.

In *Kew Bulletin* above quoted I have stated that the leaves with the type of *Ixia caryophyllacea* belonged to some species of *Babiana*, because the developed leaf with the specimen does more nearly resemble in shape the leaves of that genus than of any *Freesia* I had then seen. But from species of *Freesia* I have since seen I am sure I was wrong in making that statement. I was also wrong in considering *F. xanthospila* to be the same as *F. caryophyllacea*. I did so because the flowers of the latter seemed quite like those of the former, but now that I have seen the type of *F. xanthospila*, I find they differ in the pubescence of the stem as well as in their foliage.

As Burmann's type specimen of *F. caryophyllacea* is incomplete it is not possible to determine whether its leaves were ascending or all bent towards the ground. The only clues for its identification that can be given are : (1) The rather dense minute pubescence on the stem right up to the base of the spike. (2) The larger leaf with the specimen much resembles in shape the larger of those of the plant figured under the erroneous name of "*F. alba*, Baker" in *S. Afr. Garden*. 1933, p. 111 (concerning which see under *F. lactea*), but whose flowers are totally different. (3) The lobes of the flower are narrowly oblong with sub-parallel sides and of the dimensions mentioned.

8. *F. ARMSTRONGI*, Watson in *Gard. Chron.* 1898, v. xxiv, p. 195.—Plant 10-15 inches high. Leaves ascending, 2-5 inches long, 3-8 lines broad, linear to linear-lanceolate or oblong-lanceolate or cuneately oblong, subacute to obtuse with an apiculus. Stem exceeding the leaves, branched, glabrous. Bracts 2-3 lines long, membranous at the upper part and more or less purplish-tinted. Flowers 14-17 lines long, bright rosy pink ; tube 9-11 lines long, abruptly contracted into the slender part, which is 3-4 lines long and yellow ; lobes 5-6 lines long, the three outer oblong and 2-3 lines broad, the three inner cordate-ovate and 4-6 lines broad, all obtuse.—*Garden*, 1901, v. lix, p. 374 with fig. ; *Garden Mag.*, 1902, p. 352 ; *Gard. Chron.*, 1904, v. xxxv., p. 149 ; *S. Afr. Gard.*, 1933, p. 111, with fig., and 1929, p. 385. *F. Metelerkampiae*, L. Bol. in

S. Afr. Gard., 1927, p. 336 as to the figure only, not as to the text.
F. brevis, N. E. Br. in *S. Afr. Gard.*, 1933, p. 263.

Humansdorp Div.: Zuurbron, 700 ft., *Armstrong!* *Fourcade* 3978!
 Humansdorp, *Drège* 126! near Hankey, *Andrews* in *Hb. Galpin* 4692!
 locality unknown, *Bowie*!

Although this beautiful species has only been known to science for about 36 years it was discovered by Bowie over 100 years ago, as evidenced by an excellent coloured drawing of it at Kew, made by Bond (a Kew artist) on May 19th, 1826, from a plant cultivated at Kew which was introduced by Bowie.

F. Armstrongi is the only known species of the genus with wholly pink flowers; therefore it has been largely used in Europe and America for hybridising and has given origin to a large number of garden hybrids.

With reference to the name *F. Metelerkampiae* quoted above, it may be well to explain that an extraordinary misidentification was made in connection with this plant, for that name was definitely given by Mrs. Bolus to the plant figured in the *Botanical Register* t. 135 as *Tritonia refracta* (see note under *F. refracta*). But the plant figured by Mrs. Bolus as being the same as the plant represented in the *Botanical Register* is manifestly a totally different species. This I pointed out in a note sent to the Editor of *S. Afr. Gardening* in Dec., 1932, and gave the name *F. brevis* to the plant figured. This note, however, was not published until Nov., 1933, although a criticism of it by Mrs. Bolus was published in the issue for May, 1933, p. 111. That note was written several months before I commenced to prepare this account of the genus, and I had not then discovered that the type specimen of the figure mentioned had been seen by Dr. Fourcade and identified by him as being *F. Armstrongi* (see *S. Afr. Gard.* 1929, p. 385), and in my opinion Dr. Fourcade's identification is correct, or rather, as the colour of the flower of the plant Mrs. Bolus has figured is stated to vary "from a greenish yellow with orange and purple to an almost entirely pinkish purple," that it is a garden hybrid derived from *F. Armstrongi*. Its origin is not known, but doubtfully assigned to Robertson Div. without a reason being given.

9. *F. HERBERTI*, N. E. Br. Plant about 9 inches high. Leaves 4 or 5 to a corm, erect or ascending, $4\frac{1}{2}$ -6 inches long, 2-4 $\frac{1}{2}$ lines broad above the middle, the upper half being sometimes about one-third broader than the lower part by a rather abrupt increase in width of the upper edge, linear, subobtuse. Stem not overtopping the leaves, unbranched, sprinkled on the lower part with microscopic points. Spike of the only specimen seen with two flowers, which are turned in different directions, perhaps in the process of drying. Bracts 2 $\frac{1}{2}$ -3 lines long, very obtuse, apiculate, green. Flowers about 15 lines long; tube about 9 lines long,

about 5 lines broad at the base of the lobes and abruptly contracted into the slender part, which is $2\frac{1}{2}$ lines long and $1\frac{1}{2}$ lines in diameter in the dried flower, and very little longer than the bracts; lobes 5-6 lines long and 4-5 lines broad, obovate, very broadly rounded at the apex, all narrowed (none earlobed) at the base; the colour is not determinable, but the lower lobes are blotched with yellow in the usual manner.—*Sparaxis Herberti* of Herbaria ex Klatt in *Linnaea*, v. xxxiv, p. 674, under *Freesia xanthospila*, Klatt.

South Africa: Locality and collector unknown. Cultivated specimen!

Described from a single specimen in Berlin Herbarium labelled "*Sparaxis Herberti*. May 48, H.b.B. Herb Kunth," meaning that it was cultivated in Berlin Botanic Garden under that name and collected by Prof. K. S. Kunth in May, 1848. It is quoted by Klatt as being the same as *F. xanthospila*, Klatt, and is so labelled by him. But it is quite different from that species in foliage and flowers, and differs from that and all other known species by the remarkably stout slender part of the flower-tube, in which character it is quite unique, and the very broadly-rounded tips of the lobes are also different from those of any other known species.

10. *F. CORYMBOSA*, N. E. Br. in *Kew Bull.* 1929, p. 132. Plant varying from 5-18 inches high according to the supply of moisture. Leaves of flowering plants ascending (but, according to MacOwan in *Gard. Chron.* 1888, v. iii, p. 492, "on first starting the leaves turn over sideways flat to the ground, and do not take the erect position till the scape appears"), 2-6 (or under cultivation up to 16) inches long, $1\frac{1}{2}$ - $4\frac{1}{2}$ lines broad, linear, tapering to an acute point. Stem exceeding the leaves, usually branched, glabrous. Bracts 2-3 lines long, membranous, with dark brown or blackish tips. Flowers 12-19 lines long, of varying shades of yellow, sometimes slightly flushed with purplish on the back, and with the throat and middle lobe and one side of each lateral lobe of the lower lip orange-yellow; tube 8-13 lines long abruptly contracted into the slender part, which is 3-7 lines long; lobes 4-6 lines long, the three outer oblong and about 3 lines broad, the three inner distinctly cordate or ear-lobed at the base and $3\frac{1}{2}$ -5 lines broad, with the lower margins of the lateral pair incurved, all obtuse.—*Gladiolus corymbosus*, Burmann, *Fl. Cap. Prod.*, p. 2 (1768), and N. E. Br. in *Kew Bull.*, 1929, p. 132. *Tritonia odorata*, Loddiges, *Bot. Cab. t.* 1820 (1832). *Freesia odorata*, Ecklon ex Klatt in *Linnaea*, v. xxxiv, p. 672 (1866); L. Bolus in *S. Afr. Gardening*, 1929, p. 385, with fig.; Neubert, *Deutsch Gart. Mag.*, 1883, p. 289.

Humansdorp Div.: Hankey, *Paterson* 3194! Groot Hoek, *Fourcade* 745! Kouga, 2200 ft. alt., *Fourcade* 3122! Uitenhage Div.: between Zwartkops and Sundays Rivers, *Ecklon* 286! between Van Stadensberg

and Zwartkops River, *Zeyher* 4026! near Zwartkops, *Brak* 7! *Tredgold* 35! *Bowie*! *Pappe*! *Kemsley* 1139! Bathurst Div.: between Blaauw Krantz and Kaffir Drift, *Burchell* 3652! 3711! between Bushmans River and Karega River, *Ecklon* and *Zeyher* *Irid.* 108! Albany Div.: near Grahams-town, *Burke*! *Glass* 558! *MacOwan* 90! *Atherstone*! *Galpin* 153! 207! *Rogers* 27576! *Zeyher*! *Dyer*! *Salisbury*, *MacOwan* 90! *Dregé* 593! Fish River Rand, *Hutton* 495! near Haarlem, *Schonland* 3098! Alicedale, *Cruden* 44! Peddie Div.: Line Drift, *Sim* 4083!

Var. *aurea*, N. E. Br. This is a variety that is stated to be "quite scentless," but otherwise only differs from the ordinary form by its shorter and rather broader flowers, which are about 13-14 lines long with the funnel-part of the tube 6-7 lines in diameter, and the colour is of a rich deep orange-yellow, more intense than in other forms.—*F. aurea*, Henderson ex Gumbleton in *Gard. Chron.* 1896, v. xix, p. 392, and 1902, v. xxxi, suppl. p. ii; *Garden*, 1909, p. 591.

Locality unknown: of this I have seen only a cultivated specimen from *Gumbleton*!

F. corymbosa is widely known in herbaria as being *F. refracta*, Klatt, some of the specimens being so named by Klatt himself, and it is this misidentification that has caused so much confusion. For although Klatt saw and autographed the type specimen of *Gladiolus refractus*, Jacq. (on which *F. refracta* is founded) he confused *F. corymbosa* with that species, and botanists (myself included) accepted that determination as correct because the true *F. refracta* has hitherto remained unknown to them. When publishing my account of Burmann's S. African Iridaceae, believing Klatt could not make such a mistake in identifying this very distinct species, I referred *F. refracta* as a synonym of *F. corymbosa*, which, now that I have been able (through the courtesy of the Director of Vienna Herbarium) to examine the type of *Gladiolus refractus*, Jacq. on which *F. refracta* was founded, I find to be quite wrong, and the same error was repeated in *Gard. Chron.* 1932, v. xcii, p. 467, and in *S. Afr. Gard.*, 1933, p. 263, both accounts being written long before I began to investigate this genus critically.

When Klatt published *F. refracta* in *Linnaea*, v. xxxiv, p. 673 (1866), he quotes for it specimens in Berlin Herbarium collected by Drège and by Mund and Maire. These (by the courtesy of the Berlin authorities) I have now been able to examine, and find that the specimen collected by Drège is identical with those of Ecklon and Zeyher *Irid.* 108, which he describes as *F. odorata*, Eckl., and both are the same as *Gladiolus corymbosus*, Burm. with which I have compared them! The Mund and Maire specimen, however, is a totally different species and identical with

F. Muirii, N. E. Br. This means that Klatt actually confused three perfectly distinct species under the name *F. refracta*!

Under cultivation the leaves (as in other species) are usually longer than those of wild plants, and Mr. R. A. Dyer informs me that under cultivation at Grahamstown this short-leaved wild plant develops leaves 12-16 inches long, of which there is an example in Kew Herbarium; the flowers, however, do not alter in character.

The variety *aurea* on account of its rich colour has been much used for hybridising purposes, the hybrid *F. Chapmanii* being one of the results.

11. *F. REFRACTA*, Klatt in *Linnaea*, v. xxxiv, p. 673 (1866). Plant 6-18 inches high. Leaves ascending, 3-15 inches long, 2-5 lines broad, linear, tapering to a very acute point, not or but very slightly broadened at or below the middle and, according to Gumbleton, "of a much deeper shade of green than in any other *Freesia*" in cultivation in 1896. Stem usually branched, sometimes simple, overtopping or occasionally only equalling the leaves, glabrous. Bracts $2\frac{1}{2}$ -3 lines long, membranous, variably subtruncate or rounded and apiculate or acute at the apex on different specimens, whitish or pallid with faintly purplish veins or purplish tinted at the apex (in Ker's figure they are wrongly coloured brown). Flowers 14-18 lines long, dingy greenish yellow, suffused with dull violaceous or purplish on the back of the upper lobes, and the three lower lobes marked with fulvous or brownish yellow, each with a purple mid-line; tube 9-12 lines long, abruptly contracted into the slender part which is $2\frac{3}{4}$ -4 lines long; lobes 4-6 lines long; the outer 2- $2\frac{1}{2}$ lines broad, oblong; the inner 3-4 lines broad, ovate and cordate or ear-lobed at the base, the lower pair having inrolled margins, all obtuse.—*Gladiolus refractus*, Jacq. *Icon. Rar.*, v. ii, p. 4, t. 241 (1786), and *Collect. Suppl.*, p. 26 (1796); Redouté, *Liliaceae*, t. 419 (1813). *G. resupinatus*, Persoon, *Synop. Plant.*, v. i, p. 45 (1805). *Tritonia refracta*, Ker in *Ann. of Bot.*, v. i, p. 228 (1804), in *Bot. Reg.*, 1816, t. 135, and in *Irid. Gen.*, p. 119. *T. securigera* d, partly, Drége, *Docum.*, p. 123. *Freesia refracta*, Foster in *Gard. Chron.*, 1888, v. iii, p. 588; Gumbleton in *Gard. Chron.*, 1896, v. xix, pp. 391, 392, f. 51; Bailey, *Cyclop. Hort.*, p. 609, f. 870, and *Standard Cyclop. Hort.*, p. 1277, f. 1578. (Several other figures are published under the name of *F. refracta*, but as I have not seen them they are not quoted here.) *F. Metelkampiæ*, L. Bolus in *S. Afr. Gard.*, 1927, p. 336, as to the text but not as to the figure. *F. Hurlingii*, L. Bolus in *S. Afr. Gard.*, 1933, p. 111, with figure.

Worcester Div.: between Osplaats and Tunnel Sidings, Rogers 16739! Riversdale Div.: Hooge Kraal, Drége! near Riversdale, Muir 4432! *Ferguson*! Snijmans Kraal, Muir 4433! Swellendam Div.: at Bonnievale, Hurling and Neil! and cultivated specimens including Jacquin's type!

F. refracta is the oldest generally known name in the genus, and was described and figured from cultivated plants, yet it is remarkable that in all the herbaria examined there are only four cultivated specimens preserved, the type and two others in Vienna herbarium, and a very poor one in Lemann's herbarium at Cambridge, which is from a plant cultivated at Kew prior to 1852. Two of these have the spike continuous with the stem just as Redouté represents, instead of being abruptly bent from it. I have never seen it alive, as the plants so named that I have seen were not this species, and Ker and Gumbleton have both stated that it was rare in cultivation when they wrote of it.

Although Klatt saw, described and has named and autographed Jacquin's type specimen of *Gladiolus refractus* as being *F. refracta*, Klatt, he does not quote it at the place of publication. But the specimens of Drège and Mund and Maire in Berlin herbarium, which he does quote as being *F. refracta*, are misidentifications, one being identical with *F. Muirii*, and the other with the species he describes on the same page as *F. odorata*, Eckl., which is a synonym of *F. corymbosa*. And it is *F. corymbosa* that Klatt has named as being *F. refracta* in Kew herbarium, and it is so named in other herbaria. It is this misidentification that is so misleading and has caused much confusion.

The locality from which the type was introduced is not known, but it was rediscovered by Drège over 100 years ago, and later by others. The Bonnièvre specimens, which are identical with Jacquin's type, have been described by Mrs. Bolus as a new species.

As S. African botanists in *S. Afr. Gard.*, 1933, p. 111, have asserted that the figure in the *Botanical Register*, 1816, t. 135, does not represent the same plant as the figure of *Gladiolus refractus*, Jacq. Icon. Pl. t. 241, I may mention that they are considered to represent the same plant by European botanists and horticulturists alike, especially those who have seen the plant alive. Prof. Michael Foster at the place quoted remarks that Jacquin's figure "seems to be the same (as Bot. Reg. t. 135), but the drawing is very inferior and difficult to judge by." I find no fault with the drawing, but the coloration is decidedly bad and does not at all agree with Jacquin's description, which states that the flowers are "dingy yellow, dull purplish on the back of the lobes; the lower three lobes marked with a dull purple midline, and the two lateral with fulvous margins on the inner side, and the middle one with both margins fulvous." No difference whatever can be seen in the structural characters represented in the three figures cited; it is the coloration that is faulty. Jacquin's description well agrees with the specimens quoted and with the descriptions of Foster and Gumbleton, who described from living plants.

As pointed out in the *Gard. Chron.*, 1932, v. xcii, p. 467, and in *S. Afr.*

Gard., 1933, pp. 262, 263, the name *F. Metelerkampiae*, L. Bolus was based solely upon the figure in *Botanical Register*, t. 135, but the plant figured under that name is a totally different species and is a palpable misidentification; according to *S. Afr. Gard.*, 1929, p. 385, Mr. Fourcade identified the plant figured as being *F. Armstrongi*, in which I believe him to be correct, or that it is a hybrid derived from that species.

12. *F. MUIRII*, N. E. Br. in *Gard. Chron.*, 1932, v. xcii, p. 467. Plant varying under natural conditions from 6 inches to 2½ feet high. Leaves ascending or suberect, 2 inches to 2 feet long on native plants, 2-6 lines broad, soft and grassy, linear, acute or tapering to an acute point. Stem shorter or longer than the leaves, simple or branched, quite glabrous or with microscopic points on the lower part. Bracts 2-4 lines long, green. Flowers 1¼-1½ inches long, white or pale yellow, with rich yellow or orange-yellow blotches on the lower lobes and the slender part of the tube also yellow; in the process of drying or when fading the lobes often change to a light violaceous colour; tube 10-14 lines long, rather abruptly passing into its slender part, which is 2½-3 (rarely 4) lines long; lobes 6-7 lines long and 3-4½ lines broad, all oblong or elliptic-oblong, slightly and gradually narrowing to the base, obtuse.—*Tritonia securigera* d, partly, and e, Drège, *Docum.*, p. 123.

Riversdale Div.: Hooqe Kraal, *Drège!* near Riversdale, *Muir* 383! 4504! 4505! *Ferguson!* Mossel Bay Div.: Mossel Bay, *Drège!* *Rogers* 4146! *Muir* 4849! 4849B! *Prior!* *Penther* 768! Bredasdorp Div.: on the farm Nachtwacht, *Smith* 3045! Without locality, *Breutel* 23! a specimen cultivated at Kew before 1852 in Cambridge Herbarium! and another in Berlin Herbarium collected by *Mund and Maire* and quoted as being *F. refracta* by Klatt!

This and *F. refracta* are very variable in size under natural conditions, and few would at first think the small form with leaves only 2-7 inches long could be the same species as specimens with leaves 1½-2 feet long; the flowers, however, are identical, and both forms grow in the same locality, but probably receive a different amount of water.

13. *F. SPARRMANNII*, N. E. Br. in *Fl. Pl. S. Afr.*, v. i, under t. 11. Plant 4-8 inches high, leaves ascending, 2-6 inches long, 2-4 lines broad, linear, tapering to an acute point. Stem not or scarcely overtopping the leaves, branched, glabrous or with microscopic points or microscopic hairs on the lower part. Bracts 2-2½ lines long, green. Flowers 12-15 lines long, apparently white or creamy; tube about 9 lines long, tapering into the slender part, which is 5 lines long; lobes 5 lines long and 1½-2 lines broad, all oblong, very slightly and gradually narrowed at the base, obtuse or subacute.—*Gladiolus Sparrmannii*, Thunb. in *Kongl. Vet. Acad. Handlingar*, 1814, p. 189, t. 9A, and *Fl. Cap.*, ed. Schultes, p. 49.

Swellendam Div.: Along the Buffeljagts River, Zeyher 4027! and without precise locality *Sparrmann* in Thunberg's herbarium!

Thunberg describes the flowers as "blue and white," by which he doubtless meant they were white inside with a bluish or violaceous tint on the outside of the upper lobes. He received the specimen from Sparrmann in or before 1814. I have been able to compare it with Zeyher's 4027 and find it identical with that plant, which is named "*F. refracta*" by Klatt in Vienna herbarium.

The stem of different specimens varies from glabrous to besprinkled with minute points, to others with distinct minute hairs, visible only under a strong lens, and on one specimen seen with two stems from the same bulb one stem is glabrous and the other has minute points upon it.

For *F. Sparrmannii*, L. Bolus see *F. flava*.

14. *F. GENTILIS*, N. E. Br. Cultivated plant about a foot high, probably dwarfer in a natural state. Leaves ascending, 5 or 6 to a corm, $5-7\frac{1}{2}$ inches long, $3-5\frac{1}{2}$ lines broad, abruptly and considerably broadened on the upper edge at about an inch above the base, broadly linear, rather shortly acute at the apex. Stem simple or branched, glabrous or sprinkled on the lower part with microscopic points, seen only with a strong lens. Terminal spikes 8-11-flowered. Bracts 4-5 lines long and the outer rather longer than the inner, obtusely rounded at the apex, green or tinted with purplish, and with membranous margins. Flowers $2-2\frac{1}{4}$ inches long, apparently creamy or light yellow within, without any W-shaped or other marking in the tube, the lower middle lobe and basal part of the tube is orange-yellow, and the three upper lobes are sometimes flushed with the purplish on the back; tube 17-18 lines long, nearly straight, the flower being slightly turned back at the base only, and the funnel-shaped part tapering into the slender part, which is 5-6 lines long; lobes 9-10 lines long unequal in breadth, the dorsal one about 6 lines broad and concave?, the lateral 4-5 lines broad, and the middle lower one about $3-3\frac{1}{2}$ lines broad, all oblong, obtuse, slightly narrowed at the base.

Carnarvon Div.: Van Wyks Vley, *Alston*!

Described from dried specimens of cultivated plants grown from bulbs sent by Mr. E. G. Alston from Van Wyks Vley to Cape Botanic Garden, probably in 1892, when he also sent *F. Andersoniae* from the same locality. The type is in Cape Town Herbarium and a portion of it at Kew, and is named by Prof. MacOwan as being *F. refracta*, Klatt, from which it is entirely different. The dried specimens much resemble those of *F. Andersoniae* from the same locality, but distinctly differ in their more abruptly pointed and less acute leaves, which are also much more abruptly broadened on the upper edge above the base than they

are in *F. Andersoniae*. The bracts are less membranous and the outer one is rather longer (not shorter) than the inner, more obtuse and without the blackish tips. The tube of the flower is without a trace of the W-shaped markings characteristic of *F. Andersoniae*, and the lobes seem more irregular in their breadth.

15. *F. PICTA*, N. E. Br. Plant 5-8 inches high or taller under cultivation. Leaves about 7 to a corm, ascending, 2-6 inches long, $2\frac{1}{2}$ - $3\frac{1}{2}$ lines broad or larger under cultivation, linear, tapering to an acute point. Stem not overtopping the leaves, branched, glabrous or sprinkled below with microscopic points, even sometimes on the same specimen where two stems are present. Bracts 4-6 lines long, green, often more or less tinted with purplish. Flowers $1\frac{1}{2}$ -2 inches or more long, with the upper three lobes apparently creamy or pale sulphur-yellow within and purplish on the back, and the lower three lobes perhaps yellow, of which the lateral have darker yellow or orange margins and the middle one is darker than the others or orange-yellow; the base of the funnel-shaped part and the slender part of the tube is also orange-yellow; tube 12-18 lines long, gradually tapering into the slender part, which is 5-7 lines long; lobes 7-10 lines long, $3\text{--}4\frac{1}{2}$ lines broad, all oblong, obtuse, slightly and gradually narrowed at the base.

Beaufort West Div.: Without precise locality, *Black!* and cultivated specimens!

Judging from the specimens seen, mostly cultivated, this is the handsomest species of the genus. A specimen in Zurich Herbarium is about 15 inches high, with leaves 9-12 inches long and 3-4 lines broad, all other specimens seen being of the size given above.

16. *F. XANTHOSPILA*, Klatt in *Linnaea*, v. xxxiv, p. 673 (as to description partly and the figure quoted, but excluding the synonym and specimen quoted, for which see *F. Herberti*). Plant 6-10 inches high. Leaves erect or ascending, 3-8 inches long, $3\text{--}5\frac{1}{2}$ lines broad, broadly linear to lanceolate-linear, usually somewhat abruptly broadened on the upper edge below the middle, shortly or somewhat abruptly acute at the apex, not gradually tapering to a point, thin and grassy in texture, glabrous. Stem not or rarely overtopping the leaves, simple or occasionally branched, sprinkled with microscopic points only visible under a strong lens. The spike of the specimens seen and in the original figure is more or less continuous with (not abruptly bent from) the stem. Bracts $3\frac{1}{2}$ -4 lines long, very shortly pointed, green. Flowers 18-23 lines long, white, with a blotch of yellow on the lower lobes or lower middle lobe, and the base of the funnel-shaped part of the tube also yellow; tube 10-13 lines long, abruptly contracted into the slender part, which is 4-5 lines long; lobes about 7-8 lines long, $3\frac{1}{2}$ -4 lines broad, all oblong,

obtuse, slightly tapering at the base.—*F. xanthospila*, Klatt, *Ergänz.*, p. 26, excluding synonyms not quoted here and the specimen quoted, which latter belongs to *F. lactea*. *Gladiolus xanthospilus*, Redouté, *Liliaceae*, t. 124 (1807). *Sparaxis Jouberti*, Lodd. in *Delect. Hort. Dresden*, 1833 and 1835, ex Walpers, *Ann. Bot.*, v. vi, p. 49. *Tritonia xanthospila*, Ker ex Spreng. *Syst.*, v. i, p. 154. *Montbretia xanthospila*, Heynhold, *Nom. Bot.*, v. ii, p. 418.

South Africa : Locality and collector unknown, cultivated specimens!

Var. *LEICHTLINII*, N. E. Br. Plant like the type in habit and foliage. Stem branching or simple, usually sprinkled with microscopic points on the lower part, but sometimes glabrous. Bracts and flowers as in the type except that the lobes and tube of the flower are yellow, with the three lower lobes marked with orange blotches.—*F. Leichtlinii*, Klatt in *Gartenfl.* 1874, p. 289, t. 808, and *Ergänz.*, p. 26 ; *Floral Mag.*, 1875, No. 45, with fig. ; *Gard. Chron.*, 1875, v. iii, p. 590, f. 121, and 1888, v. iii, pp. 588 and 589, f. 79 ; Neubert, *Deutsch Gart. Mag.*, 1883, p. 289 ; *Garden*, 1909, p. 590. *F. Leichtliniana*, Burbidge, *Floral Mag.*, 1876, t. 218. *F. refracta* var. *Leichtlinii*, in *Garden*, 1882, v. xxiv, p. 94, with coloured fig. ; Bailey, *Cyclop. Amer. Hort.*, p. 608, f. 869, and *Stand. Cyclop. Hort.*, p. 1278, f. 1579. *F. Leichtlinii* var. *major*, Gumbleton in *Gard. Chron.*, 1896, v. xix, pp. 392 and 397, f. 54, a large-flowered form.

South Africa : Locality and collector unknown, cultivated specimens only seen! Among them is one sent to Kew in 1873 by Max Leichtlin under the name "*F. Leichtliniana*, Klatt," so that this is doubtless from a type plant. And Prof. Michael Foster states that the plant he describes and figures in the *Gardeners' Chronicle*, 1888, above quoted, was also obtained from Mr. Max Leichtlin.

I have seen typical specimens of *F. xanthospila* in Vienna Herbarium, one of them being so named by Klatt himself and signed by him, and as it appears undoubtedly to be the same as *Gladiolus xanthospilus*, Redouté may be accepted as a type of the species. The label bears upon it the name "*Sparaxis Jouberti*, Lodd," of which no description was published.

The native locality of neither the type nor the variety is known, but as they appear to differ only in the colour of their flowers, and dried specimens of them are sometimes scarcely distinguishable on account of change of colour, I think it probable that when the locality is discovered the white and the yellow-flowered forms may be found growing in the same general area, just as white and pale yellow forms of *F. Muirii* are found growing in the same area. Possibly the variety *Leichtlinii* may be the plant alluded to as having "pale golden daffodil" flowers by MacOwan in his letter quoted under *F. lactea*. But in that same letter he also remarks : "We got seed of *F. Leichtlinii* from Vilmorin, grew it to

flower and should have thrown it aside as a poor form of the yellow *refracta*, and scarce worth distinction as a garden variety. I send you a flower of this." The flowers sent and which are preserved at Kew are those of typical *F. Leichtlinii*, and in their bracts and structure are totally different from the "yellow *refracta*," i.e. *F. corymbosa*. This statement of MacOwan's and the fact that in the Cape Herbarium he has mounted specimens of *F. Leichtlinii* and *F. corymbosa* on the same sheet (No. 20972) as being the same species demonstrates, as elsewhere noted, that little attention has been paid by most botanists and horticulturists to the distinctive structural and other characters these plants have. This want of knowledge has caused many botanists (including myself) to make gross misidentifications of these plants as an examination of the nomenclature found in various herbaria will testify. For unless one does know of these characters and pays strict attention to them it is quite easy to mis-identify allied species.

Concerning my former reference of *F. xanthospila* as a synonym of *F. caryophyllacea* see note under that species on p. 13 and under *F. corymbosa*, p. 16.

The variety *Leichtlinii* was evidently imported into Italy before 1873, as it is stated to have been found by Max Leichtlin among some neglected plants in the Botanic Garden at Padua; its previous history is unknown.

17. *F. LACTEA*, Fenzl ex Klatt in *Zeitschr. Schweizerischen Gartenbauvereins*, 1881, p. 37, t. 3, under *F. refracta alba*, Klatt. Plant 8-10 inches high. Leaves ascending, narrow, 3-7 inches long, 2-4 lines broad, or under cultivation sometimes much broader, as Prof. Michael Foster has described them as being "5 lines to 1 inch broad," linear, with only a slight and gradual rise on the upper edge at the lower part, tapering to an acute apex. Stem about as long as the leaves, usually branched, sometimes simple, glabrous or with microscopic points on the lower part. Bracts 4-6 lines long, thin, green. Flowers 2-2½ inches long, entirely white except at the lower part of the tube, which is yellow; tube 15-18 lines long, with the slender part 6-8 lines long and the upper part gradually tapering into it; lobes subequal, 6-7 lines long, 3-4 lines broad, oblong, obtuse, all gradually and slightly narrowed at the base.—*Freesia alba*, Foster in *Gard. Chron.*, 1888, v. iii, p. 588; Baker, *Handb. Irid.*, p. 167 (1892), not of L. Bolus. *F. refracta* var. *alba*, *Gard. Chron.*, 1878, v. x, p. 23, name only, and Klatt as above quoted; *Garden*, 1881, v. xix, p. 465, and 1882, v. xxii, p. 94, with fig., and 1887, v. xxxi, p. 529; *Amer. Gard.*, v. ii, p. 25, f. 35; *Gartenfl.*, 1888, p. 412, f. 94, and 1889, p. 356, f. 59; Orcutt in *West Amer. Scien.*, 1895, p. 6; Neubert, *Deutsch Gart. Mag.*, 1895, p. 277; Mollers *Deutsch Gart. Zeit.*, 1896, p. 78; *Journ. Hort.*, 1900,

p. 197; Bailey, *Cycl. Amer. Hort.*, p. 609, with fig.; *Rev. Hort. Belg.*, 1912, p. 12. *F. Sparrmannii* var. *alba*, N. E. Br. in *Fl. Pl. S. Afr.*, v. 1, under t. 11; and the synonymy and specimen wrongly quoted under *F. xanthospila*, Klatt, *Ergänz.*, p. 26.

Knysna Div.: Plettenberg Bay, *Keet* 1021! The Heads, *Keet* 1042! Knysna Forests, *E.S.C.A. Herb.* 439! Knysna, *Miss Neudigate* ex Klatt Cape Div.: Table Mountain, doubtless escaped from cultivation, *Rehmann* 594! gardens at Cape Town, *Tyson* 2473! Division? *MacOwan* 2482! Venezuela: Caraccas Prairie (in 1884), introduced, *Ernst*! And cultivated specimens!

The origin and history of *F. lactea* seem rather obscure and appear to be unknown in S. Africa, as a fairy-tale has been written to account for its origin. The following, however, are the statements published concerning it. The earliest mention I can find of the name "*F. refracta* var. *alba*" is that it was exhibited in London at a Flower Show of the Royal Horticultural Society by the New Bulb Co. on July 2nd, 1878, under that name and was awarded a certificate of merit. In Vienna herbarium there are cultivated specimens of it dated March 10th, 1878, and named "*F. refracta*, Klatt," so that it was probably introduced into Europe in 1877. In 1888 Prof. Michael Foster, at the place above quoted, founded *F. alba* upon "the *Freesia refracta alba* of the trade; it does not wholly correspond to *Gladiolus xanthospilus* of Redouté's *Liliaceae*, or to any figure or description of the older writers. It seems to me a distinct type which I should propose to call *F. alba*." Baker adopts the name but does not refer to the author of it. Both Foster and Baker overlooked the fact that Klatt had previously published under his original description and figure of the plant the name *F. lactea* Fenzl had given it. Baker quotes MacOwan 2482 as being the type of *F. alba*, although his description ill accords with it. This specimen of MacOwan 2482 exactly corresponds with Klatt's excellent figure of *F. lactea* (*F. refracta alba*) and with the Vienna specimens dated 1878, which were possibly derived from the same source as the plant figured by Klatt, and it is also identical with other cultivated specimens of that period, and must, therefore, be accepted as typical *F. lactea*. This specimen of 2482 was collected by MacOwan in Sept., 1882, and received at Kew in March, 1884, and is labelled as "from cultivated bulbs brought from the district of Caledon." This statement of its origin conforms with an account published in the *Gardeners' Chronicle*, 1888, v. iii, p. 492, by H. Chalwin and P. MacOwan, where the latter states: "I believe the original locality whence the white *Freesia* was obtained by Ecklon and Zeyher was not far from Bredasdorp, at a farm called Zoetendaals Vley and towards Cape Agulhas." And he remarks on p. 493: "I have added the locality whence Ecklon and

Zeyher are believed to have got the white *Freesia* and where it is said to have been originally found by Upjohn." This mention of Upjohn is significant as will be shown later. He then continues: "The yellow *Freesias* are quite eastern; they come to us from the neighbourhood of Uitenhage. Many of Ecklon and Zeyher's exsiccata are marked A.D.B.G., that is *aus dem botanischen Garten*—meaning the plot of ground where Advocate Joubert permitted Ecklon to cultivate his bulb stock. As the *Topographisches Verzeichniss* (a pamphlet published by Ecklon) is dated 1827, there is reason to conclude that this *Freesia* has been under culture for at least sixty years, and by perpetual selection of the whitest flowers the present garden form has been fixed. Now and then in our gardens plants appear exactly resembling Redouté's fig. 124, *Gladiolus xanthospilus*, with short scape, abundant foliage and perianth yellow-stained within, purplish without. As a rule these are rogued out. I do not remember to have seen a truly wild example of the white-flowered plant. There are only garden examples in the Cape Government Herbarium." [N.B.—The only specimen of this plant seen by the writer in that herbarium at this date, Dec., 1933, is one labelled "No. 20972 *F. refracta*, Klatt," without information!] "My conclusion is that *F. odorata alba* so called, is *F. xanthospila*, Klatt, and that the type form is fig. 124 of Redouté's Liliaceae."

And in a letter received at Kew in May, 1884, from Prof. MacOwan, after remarking that "*F. refracta* is the Eastern Province plant," he states: "All along the coast from Cape Point towards Agulhas—notably near Mossel Bay—the other *Freesia* grows wild. I have never seen it in my Eastern Province peregrinations. It grows from the bulb with perfectly erect leaves. The colour varies very much from pale golden daffodil to pure white, and is either with or without purplish stains on the outside of the perianth segments. Here (i.e. at Cape Botanic Garden) we paid much attention to this lovely bulb, grew it year after year, roguing out all the yellow and purple stained individuals and sowing the whitest. This is the *Freesia refracta alba* of gardens. But it is, I believe, only a variety of *F. xanthospila*, Klatt = *Gladiolus xanthospilus*, Red. *Lil.* t. 124, which figure represents a badly-stained form."

I have quoted the above in full because, according to Mrs. Bolus in *A Book of South African Flowers*, p. 120 (1925), as noted under *F. Andersoniae* on p. 29, the same theory of the origin of *F. lactea* seems still to prevail in S. Africa.

The above statement, however, appears to be without the slightest foundation of fact, as I have not found any evidence that Ecklon and Zeyher knew anything whatever about this white *Freesia*; no specimen of it from them exists in the Cape or any other herbarium I have

examined. And surely if the plant had been in cultivation in S. Africa for 60 years before 1888, when MacOwan wrote of it as quoted above, it would have been introduced into Europe earlier, yet until 1878 *F. refracta alba* was unheard of. Also, in the area mentioned by MacOwan there are several very distinct species of *Freesia*, but as some of them have a superficial resemblance to one another it is evident MacOwan mistook them all for one species; and as he failed to notice the very obvious structural characters that distinguish *F. corymbosa* from *F. xanthospila* var. *Leichtlinii* (see note under that variety), it is probable he overlooked all other specific characters, as Marloth also did. Therefore it seems reasonable to suppose that when MacOwan took charge of Cape Town Botanic Garden in 1881 he made a mistake in considering the whole of the *Freesias* growing there to belong to one species, and that by destroying all the coloured species he really conserved a distinct native white species, which is quite different from any other in leaves, bracts and flowers. MacOwan connects Ecklon with *F. refracta* var. *alba*, but Ecklon died in 1868, twenty years before MacOwan published the above account, and, as above mentioned, there is no evidence to show that Ecklon had any knowledge of *F. lactea*, nor is the native locality of this plant either near Bredasdorp or in Caledon Division.

It is remarkable that although MacOwan sent a dried specimen of *F. lactea* to Kew under No. 2482, there is no specimen of it in his own herbarium, now in Albany Museum. But in Berlin herbarium is a sheet of specimens from MacOwan's herbarium absolutely identical in every particular with MacOwan 2482 at Kew. This sheet is labelled in MacOwan's handwriting — "Herbarium Macowanianum. *Freesia xanthospila*, Klatt. Culta in hortulo meo ad Somerset East e bulbis spontaneis ab beat. Upjohn missis." This label is not dated, but it proves that Prof. MacOwan had native bulbs of this plant sent to him (without statement of locality?) by a Mr. Upjohn, which he cultivated at Somerset East before 1881, when he left there to take charge of Cape Town Botanic Garden. In the account previously quoted MacOwan vaguely mentions the discovery of this plant by Upjohn, but does not say at what date, and evidently the expression "beat. Upjohn" on MacOwan's label means that Upjohn was dead when that label was written. I fail to learn anything of Upjohn except that he probably lived at Uitenhage, which is significant as being within reach of Knysna Division, the native home of *F. lactea*, where it is probable Upjohn collected it, and it may possibly have been he who first introduced it into Europe in 1878 or earlier. The Knysna plant is in every way identical with MacOwan 2482 and with cultivated specimens of *F. refracta alba*.

Although *F. lactea* (under the name of *F. refracta alba*) was formerly exported from S. Africa to Europe and America in large quantities, and I understand is now commonly cultivated there, I have not seen a figure of it in any S. African botanical work. And if we may judge from the figures of the plant published by Mrs. Bolus in *S. Afr. Gard.*, 1933, p. 111, as being "*F. alba*, Baker," it would appear that the real *F. alba*, Baker is unknown to her, because those figures represent a totally different plant, which does not appear even to have entirely white flowers, as blotches are indicated on the lower lobes, so that evidently a misidentification has been made. Without specimens to examine I am unable definitely to refer the plant figured to any known species, especially as the brief account given on p. 112 (for there is no description of "*F. alba*, Baker") entirely disagrees with the figures, which represent a plant with stiffly ascending leaves, while the account states: "I examined about fifty specimens on the Swarberg near Caledon of *F. alba*, and the leaves of all were pressed in fan formation to the ground." So that it would appear some other species (possibly *F. Muirii*) has been figured in mistake for the Caledon plant mentioned.

18. *F. FLAVA*, N. E. Br. Plant about 6 inches high. Leaves more or less, spreading in fan-like manner, $1\frac{1}{2}$ - $2\frac{1}{2}$ inches long, 3-5 lines broad, narrowly oblong or oblong-lanceolate, abruptly acute or obtuse and mucronate. Stem branched, overtopping the leaves and excluding the flowers about 3 inches long in the specimen seen. Bracts 4-5 lines long, acute, membranous at upper half, with brown tips. Flower 2- $2\frac{1}{2}$ inches long, yellow, with an orange blotch on the middle lobe of the lower lip; tube 18-21 lines long, abruptly contracted into the slender part, which is 8-10 lines long; lobes 6-8 lines long, 4-5 lines broad, oblong or elliptic-oblong, obtuse, all slightly narrowed to the base. Style exerted far beyond the anthers and as long as or longer than the entire flower.

F. Sparrmanni, var. *flava*, N. E. Br. in *Fl. Pl. of S. Afr.*, v. i, t. 11 (1920). *F. Sparrmanni*, L. Bolus in *S. Afr. Gard.* 1933, p. 112, not of N. E. Brown.

Ladismith Div.: near Ladismith, *Shand!*

Described from the specimen from which the above-quoted figure was made, now preserved in the National Herbarium at Pretoria. The figure represents the stem as simple, but the specimen has a branched stem, the upper part of the principal stem having been eaten off. The secondary branch that remains bears three flowers.

When the writer referred this plant as a variety of *F. Sparrmanni*, no specimen (only the drawing of it) had been seen and the whole genus was in such confusion that it could not be properly determined without

a complete examination of all the species, and being misled by MacOwan's note quoted under the plate mentioned, it was deemed better to refer it as a variety of *F. Sparrmanni* until better known.

Its clear yellow flowers distinguish it from all other known species except *F. Leichtlinii*, and from that the membranous bracts, longer slender part of the tube of the flower and the longer style easily distinguish it.

19. *F. ANDERSONIAE*, L. Bolus in *S. Afr. Gard.*, 1927, p. 336, f. 1-2, and in *Nature Notes* 1927, No. 50, p. 6, f. 1-2. Plant 4-10 inches high. Leaves ascending, 2-10 inches long, 1-4 lines broad, linear, shortly acute or tapering to an acute apex. Stem about as long as or sometimes overtopping the leaves, simple or branched, glabrous. Bracts 4-6½ lines long, more or less membranous at the upper part, often tinted with pinkish and with acute blackish tipped points, the inner bracts longer than the outer. Flower 1¾-2¾ inches long, sometimes but not always bent slightly backward at the base as well as rather abruptly curved forward at the top of the slender part of the tube, sweetly scented; tube 15-25 lines long, with the upper part abruptly contracted into the slender part when alive, but dried specimens often appearing to be narrow and tapering into the slender part, which is 6-16 lines long; lobes subequal, 6-8 lines long, the outer 2½-3 lines broad, oblong and not narrowed at the base; the inner 3-4½ lines broad, ovate or ovate-oblong and narrowed in a curved line to the base, but not lobed there; all obtuse, apparently creamy white ("rich ivory" ex L. Bolus) or pale yellowish within with an orange-yellow blotch on all three or only the middle one of the lower lobes, and the outside of some of the lobes apparently suffused with purplish, the slender part of the tube is orange-yellow and on the lower side of the throat are three orange-yellow blotches outlined with W-shaped purple markings.

Bechuanaland: between Takun and the stone ruins of the original town of Litakun, *Burchell* 2269! Griqualand West: Herbert Div., *Anderson* 760! Warrenton, *Adams* 149! Hay Div.; Langberg, *Hunter* 20! Div.? abundant on rocky hills of Vaal River, *Hutton*! Prieska Div., near Prieska, *Bryant* 324! Hopetown Div.; near Hopetown, *Metelerkamp*. Hanover Div.; near Hanover, *Vimpany*! Carnarvon Div.; Van Wyks Vley, *Alston*! Middelburg Div.; Conway Farm, *Gilfillan in Herb. Galpin* 5577! Orange Free State; near Fauresmith, *Smith* 385! 437! 487! 2! Graaff-Reinet Div.; Sneeuwberg, *Bolus* 1806!

A very distinct species, easily recognised by its membranous acute bracts tipped with dark brown points and by the long and peculiarly curved tube of the flower. It varies greatly in the size of its flower, evidently in accord with the amount of water received; the largest dried

specimens seen were of cultivated specimens from Van Wyks Vley, where the tube is 20-25 lines long and 5-7 lines broad at the base of the lobes; on the other hand, the wild specimens collected by Burchell in the arid region of Bechuanaland have the tube only 15-18 lines long and 4 lines broad at the base of the lobes; other specimens have flowers intermediate in size, but all have the same characters.

F. Andersoniae is the most widely distributed species known and was discovered by Burchell on Sept. 15, 1812, now over 120 years ago as mentioned on p. 3, but was confused by Baker in *Fl. Capensis* with *F. refracta*, Klatt, from which it differs entirely in appearance and structure.

The plant represented by Mrs. Bolus as being "*F. refracta*, Klatt", in *Nature Notes*, No. 4, p. 7 (1923 ?); in *Protected Wild Flowers, series A*; in *A Book of South African Flowers*, p. 120 (1925), and mentioned in *S. African Gard.*, 1933, p. 112, appears to be *F. Andersoniae*, for it certainly is not *F. refracta*, Klatt, its flowers, as represented, being totally different in size and shape from those of that species, and agreeing well with those of *F. Andersoniae*. The plant from which that figure was made is stated to have come from Oudtshoorn, but may have been only cultivated there. No description or other information is given of the plant. But in the above-quoted *Book of S. African Flowers*, p. 120, the following strange statement is made concerning it:—"All the various garden forms have been bred from this wild one and, perhaps, from another native S. African species. The horticulturists aimed with all their might at getting rid of the sulphur-yellow colour of the wild flower and at producing a pure white one." I am unable to find a particle of evidence in support of this remarkable statement, and believe it to be based upon the tradition of MacOwan's account of "*F. refracta alba*" published in 1888, which also seems without foundation, see under *F. lactea*, p. 25. In the first place there is no evidence that the plant Mrs. Bolus figures and which appears to be *F. Andersoniae* has ever been in general cultivation. And, secondly, the cultivated white-flowered plant alluded to is a native of South Africa, see *F. lactea*.

REJECTED SPECIES.

FREESIA RUBELLA, Baker in *Bull. Herb. Boiss.*, 1901, p. 868, from Delagoa Bay, Junod 166.

By the courtesy of Prof. Hans Schinz I have been able to examine the type of this species, which is in Zurich Herbarium, and find that it is not a *Freesia* but a species of *Watsonia*, so that it may now take the name of *Watsonia rubella*, N. E. Br.

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GARDEN HYBRIDS OF FREESIA.

The following list enumerates only those which I have noted in the garden periodicals consulted, and must not be taken to be a complete list. They are mostly without descriptions :—

- F. "AMETHYST," *Garden*, 1911, p. 323, coloured figure.
- F. CHAPMANII, *Garden*, 1906, p. 99, and 1907, p. 165, with fig., and 1909, p. 591, with a coloured figure of this and other hybrids. Stated to be a hybrid between *F. refracta alba* (= *F. lactea*) as seed parent and *F. aurea* (= *F. corymbosa* var. *aurea*) as pollen parent.
- F. EXCELSIOR, *Gard. Chron.*, 1914, v. lv., p. 152 ; *Journ. Roy. Hort. Soc.*, v. xl., *Proc.* p. 56, f. 32.—Leaves nearly an inch in breadth. Lobes of the flower all oblong, obtuse, none earlobed at the base, deep cream coloured, blotched with orange.
- F. "GLOW," *Garden*, 1911, p. 323, with coloured figure.
- F. GRANDIFLORA VIRGINALIS, *Garden*, 1907, p. 165.—Flowers described as "white with a dash of yellow on one of the lower segments." Can this be the same as *F. xanthospila*, Klatt ?
- F. HYBRIDA, *Gartenwelt*, 1909, p. 678, with plate.
- F. KEWENSIS, *Journ. Hort.*, 1904, v. xlviii, p. 179 ; *Kew Bull.*, 1910, p. 323.—A hybrid between *F. Armstrongi* and *F. Leichtlinii*, raised at Kew in 1904, with flowers about an inch in diameter, having a long tapering tube and spreading lobes, pale lilac-pink, suffused with pale yellow in the tube.
- F. "LADY ROSE," *Garden*, 1911, p. 323, coloured figure.
- F. "LE PHARE," *Garden*, 1911, p. 323, coloured figure.
- F. LILACINA, see *F. odorata lilacina*.
- F. LUMINOSA, *Garden*, 1911, p. 323, with coloured figure.—Plant up to 30 inches high, very floriferous, having large lilac-rose flowers with a white throat, without other markings. (See *F. Tubergeni luminosa*.)
- F. MAIDENII, *Gard. Chron.*, 1911, v. l, p. 62.—A hybrid between *F. refracta alba* (= *F. lactea*) fertilised with pollen of *F. Armstrongi*.
- F. ODORATA LILACINA, *Gard. Chron.*, 1896, v. xix, pp. 392 and 397, f. 55.—A hybrid with large flowers, represented as about three inches long, "with a distinct lilac suffusing the lower portion of the tube and petals." No other information ; the flowers figured resemble those of *F. lactea* in form, but are larger.
- F. "PURITY," *Garden*, 1916, p. 133, with fig., and p. 178.—This is also called *F. refracta* "Purity."

- F. TRICOLOR, *Gard. Chron.*, 1896, v. xix, p. 392.—Name only mentioned and the flowers stated to be "pale primrose."
- F. TUBERGENI, *Garden*, 1906, v. lxix, p. 184, with fig. ; *Journ. Hort.*, 1906, p. 299.—A hybrid between *F. refracta alba* (= *F. lactea*) and *F. Armstrongii*. Described as having "fragrant, lilac-coloured flowers, with white showing through here and there. In size and colour this *Freesia* is a great improvement upon *F. Armstrongii*." This was exhibited by the Firm of Tubergen at the Royal Horticultural Society on March 6th, 1906, and was awarded a certificate of merit. According to the figure the flowers are two inches long. Several varieties of it are figured in *Rev. Hort. Belge*, 1910, p. 265, where its history is given.
- F. TUBERGENI LUMINOSA, *Rev. Hort. Belge*, 1910, p. 265. See *F. luminosa*.
- F. VIRGINALIS. (See *F. grandiflora virginalis*.)
- F. XANTHOSPILA BELLA, *Neubert, Deutsch Gart. Mag.*, 1893, p. 229 ; *Garten'ora*, 1893, p. 729 ; *Bull. Soc. Tosc. Ort.*, 1894, p. 19 ; and *Wien Illustr. Gart. Zeit.*, 1893, p. 338, f. 68. A garden variety with a yellow blotch on the lower lobe.